



Universidade de Aveiro
Ano 2015

Departamento de Economia, Gestão e Engenharia
Industrial

**VÂNIA REIS DE
CASTRO**

**ENSINO DO EMPREENDEDORISMO: RELAÇÃO COM
A INTENÇÃO EMPREENDEDORA E A CRIATIVIDADE**



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Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Gestão, realizada sob a orientação científica da Doutora Ana Isabel Dias Daniel, Professora Auxiliar Convidada do Departamento de Economia, Gestão e Engenharia Industrial da Universidade de Aveiro.

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palavras-chave

Empreendedorismo, educação em empreendedorismo, intenção empreendedora, criatividade

resumo

Apesar do número de programas de educação no âmbito do empreendedorismo estar a crescer, o seu impacto continua a gerar controvérsia no mundo científico. Métodos pouco definidos e estratégias mal direcionadas não permitem que a educação empreendedora explore todo o seu potencial em relação ao impacto que poderá ter na intenção empreendedora dos alunos e, consequentemente, no seu possível futuro comportamento empreendedor.

A presente dissertação pretende contribuir para a compreensão deste tema através da análise da influência da unidade curricular de empreendedorismo na intenção empreendedora dos alunos, tendo por base a Teoria do Comportamento Planeado. Pretende também compreender qual a relação do ensino de empreendedorismo com a criatividade e qual o papel que esta poderá ter para a intenção empreendedora.

Keywords

Entrepreneurship, entrepreneurship education, entrepreneurial intention, creativity

Abstract

Although the number of education programs in the context of entrepreneurship is growing, its impact continues to generate controversy in the scientific world. Poorly defined methods and misguided strategies do not allow entrepreneurial education to exploit its potential regarding the impact it may have on the entrepreneurial intention of students and, consequently, on their possible future entrepreneurial behaviour.

This work aims to contribute to the understanding of this theme by analyzing the influence of the programme of entrepreneurship on the entrepreneurial intention of students, through the Theory of Planned Behaviour. It also intends to understand the relationship between entrepreneurship education and creativity and what role it can have on entrepreneurial intention.

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List of Acronyms

ATB - Attitude Towards Behaviour

C - Creativity

DEGEI - Department of Economics, Management and Industrial Engineering

EEM - Model of the Entrepreneurial Event

EI - Entrepreneurial Intention

ESE - Entrepreneurial Self-Efficacy

GCEC - Global Consortium of Entrepreneurship Centers

GEM - Global Entrepreneurship Monitor

MBA - Master of Business Administration

PBC - Perceived Behavioral Control

SN - Social Norms

TPB - Theory of Planned Behaviour

VIF - Variation Inflation Factor

Chapter 1: Introduction

According to Kuratko (2003), the generation of the twenty-first century should be considered as an entrepreneurial generation. By the year of 2003, around 5.6 million Americans, with less than 34 years old, were actively trying to start their own businesses, around 30 percent of new entrepreneurs were younger than age 30, more than 60 percent of young people between 18 and 29 year old wanted to own their own businesses.

The reality is that entrepreneurship is the new trend. Everyone, from politicians to experts and to entrepreneurs themselves, talk about this subject. According to them, entrepreneurship will be the salvation of industrial societies. To be able to follow this tendency, academic and community organizations committed to prepare entrepreneurs capable of revitalizing economy by creating jobs. Organizations yearning to develop entrepreneurship through education assume that the lack of training for entrepreneurs is the central cause for the failure of small and medium-sized enterprises (Bechard & Toulouse, 1998).

Entrepreneurship as a factor of importance to a nation is a longstanding perspective. For example, the European Union finds the encouragement of entrepreneurship to be a vital aspect in order to face the economic challenges presented worldwide (Amway, 2012). However, the reality shows that public policy aiming to make considerable enhancement in a nation's economic well-being through innovation can find that entrepreneurship education has not been able to achieve its economic goals, since education programmes and initiatives are developed in a wrong place by people with misaligned ideas or a confused opinion about what entrepreneurship is and does (O'Connor, 2013). This confirms the importance of well-defined and well orientated programmes at higher education institutions, since it is where competences and knowledge are developed to later be applied to the market, creating value, wealth and competitiveness (Batalha & Pimpão, 2011).

Within this matter, several doubtful questions have emerged and limited the value and applicability of the growing knowledge on this subject (Matlay, 2006). For example, Garavan and O'Cinneide (1994b) identify considerable variations in terms of: centres of knowledge, target audience, duration, structure and content of entrepreneurship programmes. Also, analyzing its impact, there have been doubts about the effectiveness of entrepreneurship education, in terms of economic results as well as in the development of certain individual characteristics (O'Connor, 2013).

A factor that only recently has been considered in intention-based models is creativity (Hamidi, Wennberg, & Berglund, 2008). Nevertheless, entrepreneurship and innovative behaviour are, by common sense, associated with creativity. In fact, innovativeness and creativity are characteristics usually described as differentiators between entrepreneurs and other small business owners (Cliff, Jennings, & Greenwood, 2006).

There are studies, such as a research conducted by Ward (2004), suggesting that creative individuals are more likely to develop entrepreneurial behaviour. Also, Hamidi *et al.* (2008), while performing their research, found that high scores on the creativity test produced a strong positive effect on entrepreneurial intentions.

Therefore, this dissertation aims to analyze the relationship of entrepreneurship education with entrepreneurial intention and creativity, as well as the connection between entrepreneurial intention and creativity. Understanding this relationship is essential in order to evaluate the impact of entrepreneurship education on both aspects. This study's research was conducted in the University of Aveiro, using an ex-ante, post-ante design for analyzing students' entrepreneurial intentions and creativity.

This dissertation has the following structure: first, a literature review presents the state of the art theme of entrepreneurship, including research about the importance of entrepreneurship education, the impact of entrepreneurship education on students, relationship between entrepreneurship education and entrepreneurial intention, the role of creativity in entrepreneurship and its relationship with entrepreneurial intention. The next chapter it is focused on the methodological options, description of samples and development of questionnaires used in this study, followed by the chapter where the results obtained are analyzed. And finally, in the conclusion, are taken concluding remarks on this study, and are also identified some limitations and suggestions for the future.

Chapter 2: Literature Review

2.1. Importance of Entrepreneurship Education

"It is becoming clear that entrepreneurship, or certain facets of it, can be taught. Business educators and professionals have evolved beyond the myth that entrepreneurs are born, not made." (Kuratko, 2003, p. 11). There is a lot of discussion regarding the possibility of developing entrepreneurs through entrepreneurship education, but the truth is that, for the past decades, entrepreneurship education has in fact evolved from a myth to a reality. Nowadays, not everyone believes that entrepreneurs are born and cannot be made. Some biographies of successful entrepreneurs frequently give the reader the understanding that these persons were born with an extraordinary genetic gift, but there are almost as many defying stories of those who hit the entrepreneurial jackpot without the benefits of genetics. It is clear that genetics does not play a role when it comes to entrepreneurship success (Garavan & O'Cinneide, 1994a).

Already in 1985, Peter Drucker, known as one of the leading management thinkers of our time, has recognized this reality by stating *"The entrepreneurial mystique? It's not magic, it's not mysterious, and it has nothing to do with the genes. It's a discipline. And, like any discipline, it can be learned"* (Drucker, 1985). Since that time, literature review on entrepreneurship and business management education has come to support Drucker's belief that entrepreneurial thinking can in fact be developed in individuals.

Entrepreneurship education has been categorized by Kourilsky (1995, p. 13) in three main areas: *"the identification or recognition of a market opportunity and the generation of a business idea (service or product) to address an opportunity; the marshalling and commitment of resources in the face of risk to pursue an opportunity; and the creation of an operating business organization to implement the opportunity-motivated business idea."* Furthermore, Bechard and Toulouse (1998, p. 320) have described entrepreneurship education as *"a collection of formalised teachings that informs, trains, and educates anyone interested in business creation, or small business development"*. In broader terms, entrepreneurship education can be positioned in an ample definition than business, preparing not only an entrepreneur, who may become self-employed and owner of an enterprise, but also someone who is able to chase entrepreneurship and innovation as an employee and be a person who displays enterprising behaviour (Gibb, 2002).

2.1.1. Historical Overview

Entrepreneurship education as a reality in business schools began in the early 1970s. The first Master of Business Administration (MBA) focussed on entrepreneurship was released in 1971 in the University of Southern California. From that point on, entrepreneurship education began to take its course. In the beginning of the 1980s more than 300 universities were teaching courses based on entrepreneurship and development

of small business, number that had raise to 1.050 schools by the 1990s (Kuratko, 2005). The Global Consortium of Entrepreneurship Centers (GCEC), formerly the National Consortium of Entrepreneurship Centers, was founded in 1996, at the University of Indiana in the United States of America, with the objective of establishing a continued partnership among the various well-recognized entrepreneurship centres, as well as the newer centres. This collaboration allowed the centres to work together by sharing information, developing special projects and helping one another in advancing and improving their centres' impact (Kuratko, 2003). In 2005, entrepreneurship education in the US was already taught in more than 2.200 courses at over 1.600 schools (Kuratko, 2005). But why did this reality took place? The initial expansion of entrepreneurship programmes was highlighted by students and accreditation bodies that where unsatisfied with general business education courses at university level (Solomon & Fernald, 1991).

The significant expansion observed during this period in regard to the number of courses and the contents of related programmes can also be seen as a consequence of government's belief that entrepreneurship could have a positive impact on the socio-economic and political infrastructure of a nation (Matlay & Carey, 2007). In developing countries, entrepreneurial education is also seen as a vital part for the progressive offer in private and public business schools (Li & Matlay, 2005). In addition, entrepreneurship education is also considered as the most effective way to make the switch from a graduate student of higher education into a self-employment or salaried worker (Matlay & Westhead, 2005). Therefore, one of the main topics on the top of socio-economic and political agendas is entrepreneurship education, representing a high concern for government policy all over the world, in both developed and developing countries (Mitra & Matlay, 2004).

Moreover, the European Commission (2006) dedicates special attention to entrepreneurship in high education schools and universities, referring that they should incorporate entrepreneurship as an important element of their programmes, divided by several subjects, and demand or encourage students to participate in entrepreneurship courses. The European Commission (2006) also defends that high education institutes should integrate entrepreneurship in programmes of different areas of study, since it can add value to all courses.

A high share of entrepreneurship education at university level is offered by business schools, since there is large interest in entrepreneurship amongst business school students. Nevertheless, almost every university and school has nowadays a variety of courses about how to start and sponsor new business. This is due to the increasing importance of entrepreneurship education as an approach to prepare students for surviving in the contemporary work and living environment. Thus, in addition to entrepreneurship courses taught for business students, sense of initiative and entrepreneurship have become more widely viewed as key competences necessary for all students (and society in general) despite their area of expertise (Küttim, Kallaste, Venesaar, & Kiis, 2014).

Solomon (2007) carried out one of the most comprehensive empirical analyses on entrepreneurship education. He stated that *"a core objective of entrepreneurship education that differentiates it from typical business education is the challenge to generate more quickly a greater variety of different ideas for how to exploit a business opportunity,*

and the ability to project a more extensive sequence of actions for entering business (Vesper and McMullan, 1988). To this end, entrepreneurial education must include skill-building courses in negotiation, leadership, new product development, creative thinking and exposure to technological innovation (McMullan and Long, 1987; Vesper and McMullan, 1988)."

2.1.2. Entrepreneurship Education in Portugal

In Portugal, only recently entrepreneurship education became part of programmes in universities. As a reflection of what was happening in other countries, in the last few years other areas of study started having interest in this subject, expanding its importance across different schools. The development of entrepreneurship programmes in Portugal is a recent phenomenon, since the first classes of entrepreneurship were taught in 2002 (Redford, 2008). In 2004/2005, there were 22 programmes of entrepreneurship in 17 high education institutes, number that has increased to 26 programmes and 21 institutions in 2005/2006 (SEDES, 2007). More recently, in 2010/2011, there were 27 entrepreneurship programmes/courses in Portugal, some leading to academic degree and others not. The majority of these courses are Master's Degree (78%) and the rest correspond to one PhD and four postgraduate courses. The offer of 41% of these courses is being held by public universities, 33% can be found in by private universities and the other 26% in public polytechnic institutions (Batalha & Pimpão, 2011).

According to the Global Entrepreneurship Monitor (GEM), between 2011 and 2012 entrepreneurship activities in Portugal did not suffered significant modifications in their most important rates, which means that the economic, financial and social crisis in the country has not affected negatively its entrepreneurship initiative (GEM, 2012, p. 7). This shows the growth and importance of entrepreneurship in Portugal.

According to the Amway European Entrepreneurship Report (2012), Portugal is the third European country with the biggest percentage of people self-employed (10%). Nevertheless, is one of the four countries where the citizens have a more negative attitude towards self-employment, meaning that they are less motivated to start their own business.

Along the same line, Redford (2008) has determined in their study that only 14,8% of students believed that the Portuguese education system developed the necessary potential for the creation of employment. Following the Amway Report (2012), this can be due to cultural phenomenon, like the need for stability and security, as well as the fear of failure.

In Portugal, basic and high schools, as well as some universities, are still not focused in developing skills such as autonomy, risk taking, responsibility, decision making, and self-confidence, which are fundamental in entrepreneurship. The lack of nurturing important attitudes as well as teaching basic management skills and competences from young age reinforce the magnitude that entrepreneurship education can have in this

country (Dominguinhos, Sardinha, Carvalho, Ramalho, & Pereira, 2005). In fact, the role of higher education institutes in the expansion of the level of business and management education was considered one of the most positive aspects to the structural condition of Education and Training, according to the Portuguese specialists. On the other hand, the reduced awareness given to entrepreneurship in primary and secondary education was pointed out as one of the least favourable in the context of this structural condition (GEM, 2010). As stated by Sarkar (2007, p. 7) *"The promotion of an entrepreneur and innovative spirit is no longer an option to Portugal. It is rather a primordial necessity"*.

2.1.3. Entrepreneurship Education: a challenge among researchers

Young people are challenging universities to present them with educational opportunities to understand the role of entrepreneurship and to gain the knowledge and skills essential for successful entrepreneurship. Despite this extensive growth in demand of entrepreneurship education, there is still a giant discrepancy in the quality of entrepreneurship education programmes on offer, including programmes, design, delivery methods and forms of assessment (Matlay & Carey, 2007). Unfortunately, the contents that should be the core of entrepreneurship education haven't reached general consent and, as a consequence, cannot keep up with the undeniable accelerated case of emerging of entrepreneurship education. In particular, many universities have inadvertently escalated onto the much better understood and more accessible area of business management education in their well-intentioned attempts to deal with the more hardly understandable goal of real entrepreneurship education (Kourilsky, 1995).

Since the literature in the area was only developed in the past two decades, there is a serious shortage of research centred on entrepreneurship education and training (Garavan & O'Cinneide, 1994a), especially concerning programmes designed to be delivered outside business schools, for students specialising in subjects not directly related to business or graduating from non-business schools (Matlay & Carey, 2007). While the field is expanding, most of the research has tended to be fragmented and with an exploratory, descriptive orientation. Literature shows that there is a lack of accepted paradigms or theories of entrepreneurship education and training. The lack of a clear consensus on the definition of an entrepreneur contributes to the confusion; it is therefore understandable that the content of entrepreneurship education and training programmes varies according to the trainer's personal preferences as to definition and scope (Garavan & O'Cinneide, 1994a). Due to these substantial discrepancies in what concerns course design, content and assessment powerful debates are being held between various stakeholders, regarding courses appropriateness and cost effectiveness (Matlay & Carey, 2007). For example, initially in China, entrepreneurship education was not integrated into the programmes or part of a coherent framework and initiatives were often taken up by only a few universities. In this case, entrepreneurship was more probable to be taught as a separate subject or offered as an extra-curricular activity (Li & Matlay, 2005).

Most of entrepreneurship education efforts were missing its real goal because it was not given proper attention to the essential strategic challenge that was to consider different educational needs of people in different stages of entrepreneurial process

(Kourilsky, 1995). In the early years of entrepreneurship education, most of the entrepreneurship programmes taught in universities were focusing on three main areas: (1) entrepreneurial education, (2) outreach activities with entrepreneurs, and (3) entrepreneurial research. A few years later, and more recently, the trend in most universities was to develop or expand entrepreneurship programmes and draw distinctive and challenging curriculum, specifically designed for entrepreneurship students (Kuratko, 2003).

2.2. Impact of Entrepreneurship Education on Students

Although there has been an increase in the number of programmes and initiatives in the area of entrepreneurship, there are still some doubts regarding the efficacy of entrepreneurship education, in terms of business creation and also concerning the development of skills by the students (O'Connor, 2013). The impact and benefits of entrepreneurial education are poorly understood since there has been so little accurate investigation of its effects (Garavan & O'Cinneide, 1994a, 1994b; O'Connor, 2013). Also, only a few studies support that the entrepreneurial behaviour is related to entrepreneurial education (Kolvereid & Moen, 1997).

Nevertheless, many researchers strongly believe in the significant impact that entrepreneurship education can have on the number and the quality of graduate entrepreneurs. Also, there is a growing consensus amongst policy makers and other important stakeholders that entrepreneurship education can increase both the quality and the quantity of graduate entrepreneurs entering the economy (Matlay, 2006). It is argued that students who chose entrepreneurship education as part of their curriculum tend to have a higher tendency to engage in entrepreneurship activities (Vesper & Gartner, 1997). About this subject, Reynolds (1997) concluded that education in general, and entrepreneurship education in particular, has a positive influence upon individual preference for self-employment. Another example of this impact is that entrepreneurs with higher educational achievements tend to do better, and their firms survive longer, than their equals with lower education and training (Bates, 1995).

The central argument for this agreement of opinions is based on the assumption that the entrepreneurship education programmes in high education institutes can positively influence students' attitudes towards entrepreneurship and provide future entrepreneurs with the necessary knowledge and skills to start up, manage and develop economically viable businesses (Matlay, 2006).

Krueger and Brazeal (1994) confirmed in their study that entrepreneurship education makes the idea of building their own business more viable to the participants. In the study realized by Kolvereid and Moen (1997), the behaviour of business graduate students with major in entrepreneurship is compared to the behaviour of graduate students with other majors from a Norwegian business school. The results have shown that the students with major in entrepreneurship are more prone to initiate a new business and have higher entrepreneurial intentions. According to Lüthje and Franke's study (2003), entrepreneurship education and universities support at the entrepreneurial level have a

positive impact on the entrepreneurial intentions. In the authors' study is also suggested that the lack of this type of education leads to low levels of entrepreneurial intentions among the students. Souitaris *et al.* (2007) conclude that entrepreneurship education programmes lead to the development of attitudes and global intention by the students in order for them to become future entrepreneurs.

Although there is some agreement, the several studies conducted in this area present conflicting results, what can be easily understood by the non-standardization of teaching contents, pedagogies and methodologies (O'Connor, 2013).

According to Huber *et al.* (2012), the investigation made in the area of entrepreneurship is in fact the study of the impact of entrepreneurship activities in students, which generate no consensus, since in some studies it was possible to demonstrate the connection between entrepreneurship activities and students' future intentions (Roxas *et al.*, 2008; Paço *et al.*, 2011), while other studies reveal no significant conclusions regarding this subject (Oosterbeek *et al.*, 2010).

The first studies developed in this context, like the ones conducted by Vesper and Gartner (1997), Alberti *et al.* (2004) and Henry *et al.* (2005a, 2005b), simply described the entrepreneurship programmes, by discussing their contents or evaluating their economic impact. For example, in 1994, Garavan and O'Cinneide made a transversal evaluation to five entrepreneurship programmes by measuring their success through the number of businesses and job positions created. Their results show that 755 students created 2665 job positions (Garavan & O'Cinneide, 1994b). However, these methods of evaluation are not considered very efficient, since they do not perceive any type of modification in the participants' behaviour or intentions towards the development or trigger of some sort of change at economical, social and/or business level or even in themselves (Alberti *et al.*, 2004).

The effects of this type of programme are complex and the measurable results based on the number of businesses or job positions created can often only be observed many years after participation in the course (Fayolle, Gailly, & Lassas-Clerc, 2006). According to Souitaris *et al.* (2007), it is usual for the graduate students to earn some work experience even before they consider open their own business, taking normally five to ten years to do it.

This discrepancy in results of different studies is reinforced in the study conducted by Lorz (2011). Although he has found a positive impact of entrepreneurial education on the entrepreneurial intention, in 33 of the 41 studies reviewed by him, the 8 remaining ones show mixed or negative results. This author has developed and implemented an analysis's methodology in order to fill in the diverse methodological gaps contained on these articles and has reached the conclusion that entrepreneurship education has no impact on entrepreneurial intention. Other authors, such as Peterman and Kennedy (2003) and Souitaris *et al.* (2007), have also criticized the inconsistency of these results, concluding that it is due to methodological deficiencies. Lorz (2011) highlights the fact that the majority of studies is focused on measuring the impact of entrepreneurial education only at the time when the participants have already finished the course, so there is no real evaluation of the participants throughout the programme, and also that the majority of

studies does not consider the differences between participants at a social-demographic level as well as academic background, assuming that entrepreneurial education has the same effects on all students, independently from their demographic characteristics or previous exposure to entrepreneurial behaviour.

Another relevant aspect is that most of MBA programmes only accept graduates with previous working experience and so the visible increase in success of this type of programmes could be explained by this characteristic as well as other related ones (Krueger & Brazeal, 1994). Graduates with relevant business experience could have acquired a relevant knowledge base and contextual advantage and therefore would benefit considerably from entrepreneurship education courses that outline, discuss and reinforce critical issues and solutions related to business venture creation (Taylor & Banks, 1992).

By analysing the literature on entrepreneurship education, specifically its impact, it is easily observed a number of problems regarding definition, concept and context which spreads some doubts in what concerns the validity, comparability and generalisation potential of emerging results (Matlay, 2006). There is a high heterogeneity of factors that feature entrepreneurship education, as for example target-groups, objectives and course duration, and there are no well defined and standardized methods of evaluation. Henry *et al.* (2005b) call attention for the importance and complexity of the evaluation of impact of entrepreneurship education, and reinforce that it must be performed through a rigorous approach in order to obtain precise conclusions.

Entrepreneurship education courses delivered in universities can be considerably influenced by conceptual, contextual and design differences. In addition, several personal, family and peer aspects often influence a graduate's career aspirations, entrepreneurial motivation or nascent potential (Matlay, 2006). On another hand, if entrepreneurial potential can apparently be acquired indirectly by cultural aspects and experiences it gives support to the vision that it might also be influenced by education and training interventions (Garavan & O'Cinneide, 1994a).

Although the growing body of empirically rigorous research in this area has so far provided only limited evidence to support the assumption that entrepreneurship education can generate better outcomes at various stages of entrepreneurial activity, from start-up through to exit strategies (Matlay, 2008), entrepreneurship education is relatively new and it is about innovation and creativity and it continues to assume an important and essential role in business and non-business schools. It can easily be the future for universities (Kuratko, 2005).

2.3. Impact of Entrepreneurial Education on Entrepreneurial Intentions

Throughout the years, the decision of becoming entrepreneur has been analyzed using several different approaches. The diversification of lines of study has allowed the

identification of significant connections between certain demographic features or characteristics of people and their entrepreneurial behaviour. However, the predictive capacity has been very limited (Reynolds, 1997). From a theoretical point of view, these approaches have been criticized for their conceptual and methodological problems as well as for their reduced explanatory capability (Krueger Jr. & Reilly, 2000).

From another perspective, since the decision of becoming entrepreneur can plausibly be considered as volunteer and conscious (Krueger Jr. & Reilly, 2000), it seems reasonable to analyze the decision process taken. In this sense, the entrepreneurial intention would be a previous and determinant element of the entrepreneurial behaviour (Fayolle et al., 2006). A more favourable attitude would increase the intention of going forward with it. This way, the "attitude approach" would be preferable comparing to the ones rationally used, such as approaches through personality traits or demographic features (Krueger Jr. & Reilly, 2000). In fact, literature has revealed that the insertion of entrepreneurship programmes in high education courses can contribute to increase the students' intention towards creating new businesses (Shinnar, Pruett, & Toney, 2009).

Several empirical studies have found that a person's intention to become an entrepreneur offers the best predictor of her actually engaging in entrepreneurship in the future (Krueger Jr. & Reilly, 2000). Building on more general models, entrepreneurial intentions are typically considered to be formed by a person's attitude toward entrepreneurship, prevailing social norms attached to entrepreneurship, and the person's level of self-efficacy (Hamidi et al., 2008).

Many researchers have been investigating the creation of new companies, focusing their studies on high education students analyzing their attitudes towards entrepreneurship and the aspects of the surrounding environment which influence those attitudes. Veciana *et al.* (2005) studied the institutional factors, formal and informal, that influence the creation of new businesses, as well as the perception of entrepreneurs regarding the will, viability and intention of creating a company. Olmos and Castillo (2007) analyzed the characteristics which influence positively the entrepreneurial intentions of students, taking into consideration personality traits, values, social-demographic factors and academic training. According to the authors, high education schools have an important role in motivating students to entrepreneurship. In their investigation they also developed a profile of the entrepreneurship student, having as reference the theoretical base of the Global Entrepreneurship Monitor (GEM), having identified several focus, mainly based on psychological and social-institutional factors. Toledano (2006) studied the attitudes of young people in the University of Huelva (Spain) regarding the conception of new companies and tried to verify the existence of connections between those attitudes and the factors that have usually been used to explain the entrepreneurial behaviour. According to Peterman and Kennedy (2003), the creation of new businesses is a result of an interaction between context factors, which act through their influence on the person's perceptions.

2.3.1. Intention models

The importance of entrepreneurial intentions as antecedents of planned behaviour (such as founding a new business) has been emphasized in recent years (Krueger Jr. & Reilly, 2000). Studies have shown that people have intentions towards a particular behaviour, and in turn these intentions, determine actual behaviour (Krueger Jr. & Reilly, 2000; N. F. Krueger & Brazeal, 1994). As a consequence, the process of new business creation begins when an individual develops intent to do so, which means that, entrepreneurs intent to become entrepreneurs before discovery of relevant business opportunity. One way to study entrepreneurship relevant phenomena is by applying models of attitude-behaviour relations that focus on entrepreneurial intentions. Intentions and intention formation processes are well-established subfields within entrepreneurship literature and the importance of intentions as behaviour antecedents (such as founding a business) has been emphasized in recent years (Shook, Priem, & McGee, 2003). Intentional models provide evidence that the construct of self-efficacy (the belief that one has the ability to perform tasks effectively in various situations) plays an important role as an antecedent for promoting perceived feasibility of venture and are valuable to understand intentions toward planned, intentional behaviour to engage in entrepreneurial function (Zampetakis & Moustakis, 2006).

The fundamental theory driven models that have been proposed in the literature are Ajzen's (1991) Theory of Planned Behaviour (TPB) and Shapero's (1982) Model of the Entrepreneurial Event (EEM).

2.3.1.1. The Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) was developed by Ajzen, in 1991. The TPB model explains intentions by means of attitudes, perceived behavioural control and subjective norms and is used in entrepreneurship research to model career choice targeting entrepreneurial intentions (Krueger Jr. & Reilly, 2000; Liñán, 2008). Briefly, according to the TPB, our performance of a particular behaviour is determined by our behavioural intentions to perform that behaviour while those intentions are determined by our attitude, subjective norms and perceived behavioural control concerning the behaviour. Studies based on the TPB show that behaviour can be strongly predicted by intentions and that intentions are largely predicted by these three attitudinal constructs (Lourenço & Jayawarna, 2011). For this reason, the TPB is widely used among researchers to predict the future behaviour of individuals via the intentions construct and to measure intentions themselves (Krueger Jr. & Reilly, 2000; Krueger & Brazeal, 1994; Krueger, 1993; Liñán, 2008; Lorz, 2011; Lourenço & Jayawarna, 2011).

The TPB consists of five general constructs: behavioural attitude, subjective norms, perceived behavioural control, behavioural intention and behaviour (Lourenço & Jayawarna, 2011). This theory identifies three attitudinal antecedents of intention, where two of them reflect the perceived desirability of performing the behaviour – behavioural attitude toward outcomes of the behaviour and perceived subjective norms – and the third,

perceived behavioural control, reflects the perception that the behaviour is self-controllable (Krueger Jr. & Reilly, 2000).

Someone's attitude towards the behaviour relates to the perceived desirability of performing the particular behaviour and it depends on the expectations about personal impacts of outcomes resulting from such behaviour. The subjective norms refer to the social pressure to perform or not a particular behaviour due to the expectations of others (e.g. parents, peers, and employer). Perceived behavioural control reflects the perceived ease or difficulty of performing the behaviour and is thus related to perceptions of situational competence (self-efficacy). Behavioural intention is related to the individual's willingness to perform a given behaviour. Finally, the behaviour refers to the actual performance of certain behaviour. The common rule is that the more favourable the attitude and subjective norms towards a specific behaviour and the bigger the level of perceived behavioural control, the stronger the person's intention to engage in the considered behaviour (Krueger Jr. & Reilly, 2000; Lourenço & Jayawama, 2011).

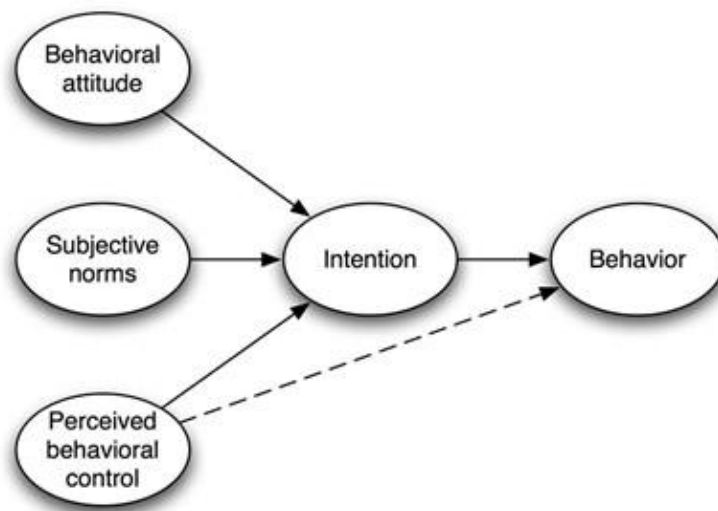


Figure 1 - The theory of planned behavior (Ajzen, 1991)

2.3.1.2. The Entrepreneurial Event Model

Another model is Shapero's (1982) Model of the Entrepreneurial Event (EEM), that is centred on the entrepreneurial event and explaining the processes that lead to it, by stating that it is affected by perceptions of desirability (the value system and social system of the individual), of feasibility (financial support and would-be partners) and also from a propensity to act. These perceptions are the product of cultural and social environments and they determine personal choice. This model is, in its core, an intention model specific to the domain of entrepreneurship (Krueger Jr. & Reilly, 2000; Liñán, 2008).

"Shapero defined perceived desirability as the personal attractiveness of starting a business, including both intrapersonal and extra personal impacts. Perceived feasibility is the degree to which one feels personally capable of starting a business. Empirically, Shapero proposed a testable eight-item inventory of questions aimed at different aspects of perceived desirability and feasibility. Empirical measures of self-efficacy (antecedents

of perceived feasibility) assess beliefs that one can personally execute a given behaviour.” (Krueger Jr. & Reilly, 2000, p. 419).

2.3.1.3. The Entrepreneurial Potential Model

Kruegel and Brazael (1994) developed a model of potential entrepreneur based on the Theory of Planned Behaviour of Ajzen and the Entrepreneurial Event Model of Shapero. The model defends that the beliefs and attitudes of potential entrepreneurs depend of their perceived desirability and perceived feasibility. The perceived desirability refers to the degree of attractiveness of a person towards a determined behaviour, in this case becoming entrepreneur. The perceived feasibility refers to the level that the person considers him or herself capable to perform a specific behaviour; specifically, it is the self-perception to create a new business (Zampetakis, 2008).

In this model, the researchers consider that the two models overlap in a considerable way. Shapero's perceived desirability corresponds to Ajzen's attitudes and Shapero's perceived feasibility corresponds to Ajzen's perceived behavioural control (N. F. Krueger & Brazeal, 1994).

So, it is possible to conclude that two critical components of the entrepreneurial intention models are perceived desirability, the degree to which a person feels an attraction towards becoming an entrepreneur and perceived feasibility, the sense of capacity regarding the fulfilment of this behaviour (Krueger Jr. & Reilly, 2000). In other words, factors influencing perceptions of the desirability and feasibility of starting a business will influence the strength of entrepreneurial intent. However, in the case of university students, recent studies indicate that students not facing important career decisions may not be concerned with the feasibility of starting a business because the event is too remote (Peterman & Kennedy, 2003).

Researchers also consider a third factor as influential for individual's intentions, which is a person's self-efficacy. Self-efficacy has been found to influence considerably entrepreneurial behaviour (Krueger Jr. & Reilly, 2000). Prior research indicates that not enough is known about the effects of different entrepreneurship programs on students' subsequent entrepreneurial behaviour, although participation in such programs does seem to raise entrepreneurial intentions (Hamidi et al., 2008). Souitaris *et al.* (2007) surveyed 124 science and engineering students enrolled in an entrepreneurship program at one British and one French university, finding that the programs raised some entrepreneurial intentions among the students. Specifically, it was found that many students had experienced key moments of inspiration that drastically changed their "heart and mind" and made them consider becoming entrepreneurs (Hamidi et al., 2008).

About this subject, Pinho and Gaspar (2012) concluded that, in each school analyzed in their study, the courses that include in their programmes classes of entrepreneurship and marketing have a higher percentage of students that would like to create their own business, comparing to other courses results. The students taking the courses that

included these classes agreed that these programmes not only motivated them but also prepared them to develop their own companies.

Surveys using different methodologies have been conducted among university students in order to investigate the factors influencing their entrepreneurial intentions. Surveys concentrate on the existence of certain personality traits (Louw, Eeden, Bosch, & Venter, 2003) or on the importance of different demographic variables, such as age, gender, levels of studies, role of parents etc. (Wang & Wong, 2004). Despite the identification of significant connections among certain traits or demographic characteristics of the individual with entrepreneurial intentions, surveys predictive capacity is limited (Krueger Jr. & Reilly, 2000; Reynolds, 1997). In a research related to the career patterns of the self-employed, Feldman and Bolino (2000) concluded that individuals with a strong creativity anchor were motivated to become self-employed. However, Lee and Wong (2004) concluded that there is not enough support for the hypothesis that among research scientists and engineers, those with a strong creativity anchor would have greater intentions to form a new business. In order to promote entrepreneurship, it is crucial to investigate the factors that may affect an individual's intentions towards new business establishment.

2.4. Role of creativity on Entrepreneurship

Referring to creativity, it may be argued that the primary issue to slow down creativity research is due to the lack of a clear and widely accepted definition for creativity, a matter of debate for decades, since there are numerous models for creativity, which has obstructed all efforts to measure the construct (Batey & Furnham, 2006). Since there is such diversity in the interpretation of the field of creativity, it is not surprising to discover that there have been a multitude of different ways suggested in which the construct can be studied (Batey, 2012).

Despite the apparent confusion and contradictions implied by many of the definitions, there does appear to be sufficient agreement in a few of them. The concept of creativity takes in the notions of creation, synthesis and modification (Andriopoulos & Constantine, 2001). With regard to definitions, many researchers have adopted the "new and useful" definition of creativity, which suggests that a creative product is the one considered to be novel or original and useful or adaptive (Mumford, 2003). How researchers interpret the new and useful definition of creativity will determine how they assess the construct (Batey, 2012).

The earliest psychological studies of creativity focused upon intellectual factors. Following this trend, researchers began to assess creativity from the perspective of personality. Interest in cognitive psychology led to investigations of the creative problem-solving process. There has also been considerable interest in the situational factors that promote or inhibit creativity (Shalley & Gilson, 2004). Sternberg (2004) suggests the amount of relevant knowledge individuals have at their disposal is one of the most important links to creativity.

A number of personality constructs have been associated with creativity. However, the line of inquiry concerning causal links between personality and creativity has been limited and focused on a narrow range of personality characteristics. Several propositions have been made concerning the ways personality influences creativity. Also, creativity is a multi-facet unit where different domains pose different demands on individuals (James & Asmus, 2001).

A few years ago, Binnewies, Ohly, and Sonnentag (2007) found that personal increased commitment in the beginning of the creative process was positively related to creativity as an outcome. Dollinger *et. al* (2005) drawing from previous research on identity, argued that students who are self explorers in the use of information, that is, actively seeking out and processing information, are more likely to have an increased creative potential. According to the researchers, individuals that actively seek out information internalize new and interesting possibilities for who they might become and this is a way to enhance their creativity.

Arthur Koestler (1964), a controversial 20th century writer, journalist, and social commentator, presented a theory. For his part, Koestler used the term bisociation to characterize the creative capability. Interested in proving that individuals' behaviours were not driven in the same way as the learned responses of animals, Koestler viewed explaining creativity as a means of making the counter argument. He believed bisociation occurred as the result of people taking two unrelated frames of reference and connecting them in a new way (Koestler, 1964).

Although interested in creativity in general, Koestler's examples had nothing to do with business. Entrepreneurial creativity, however, has been defined in a similar fashion. For instance, Teresa Amabile (1997), a Harvard Business School professor known for her research on the subject, described creativity as the generation of novel and appropriate solutions to open-ended problems in any domain of human activity. In a business context, this can occur along the dimensions of new businesses, new products, new processes, new markets, and new ways of acquiring resources.

In recent years, there have been considerable efforts to understand the economics of creativity and its role in driving business performance (Walton, 2003; Wu, McMullen, Neubert, & Yi, 2008). Because of its close relation to innovation, it has become usual to link creativity to entrepreneurship. In fact, in recent entrepreneurship studies, creativity is an intrinsic factor in the development of a business idea. Fresh and useful ideas are the support of entrepreneurship (Ward, 2004). Our ability to think creatively and imaginatively is important enterprising skills to support decisions in uncertain business situations (Lourengo & Jayawarna, 2011).

A number of themes can be drawn out when thinking about creativity learning activities for innovation. Personality characteristics impact the creative process (Bull, Montgomery, & Baloch, 1995), as for example confidence in performing specific tasks, including creative tasks, and attitude towards risk (particularly relevant to the context of entrepreneurship). It is not only self creativity but also team creativity that plays a crucial role in innovation (Barakat, Boddington, & Vyakarnam, 2014).

Identifying and selecting the right opportunities for new businesses are among the most important abilities of a successful entrepreneur (Ardichvili, Cardozo, & Ray, 2003). A perspective established in previous entrepreneurship literature acknowledges that entrepreneurship is not only about creative and innovative thinking (the art), but also requires business competence and knowledge (the science). The scientific attributes are used when organising and co-ordinating resources, meaning, running the business and taking advantage of the business opportunity. The art (concerning the fresh ways of thinking) is considered particularly useful in searching for business opportunities and, thus, creating new business ideas and exploring business opportunities (Jack & Anderson, 1999). However, it is not a categorical split, as both features may be visible in any phase of the entrepreneurial process. The results obtained by Heinonen *et al.* (2011) show that individual creativity is not directly associated with the viability of the business idea. However, the influence of creativity on the viability of the business idea is totally interceded by opportunity search strategies based either on creative or knowledge acquisition approaches. Therefore, the researchers defend that, although creativity is perceived as valuable in the business idea generation process in general, creativity has to be complemented by opportunity search activities in order to generate viable business ideas. In addition, both creative search strategies and knowledge acquisition strategies are applicable for individuals in their search for viable business opportunities, although creativity influences the viability of the business idea more effectively when conducted by creative strategies than by ideas based on knowledge acquisition (Jarna Heinonen et al., 2011).

Several studies have established a relationship between creativity and business opportunity identification. In order to become successful, entrepreneurs need to create valuable ideas for new goods or services, appealing to some particular market, and having identified those potential opportunities, they must determine how to lead the project to profitable reality. If entrepreneurs require capital to develop their new business they may even need to bring up ideas for how to convince others of the value of the project, as for example, a desirable new Internet application can be pictured but it does not end there, it is necessary to implement the idea, convince others that it is worth pursuing, and then advertise the application successfully (Ward, 2004). Creativity may also be approached in the context of entrepreneurship as the ability to rapidly recognize the association between problems and their alleged solutions by identifying non-obvious associations or by moulding or reforming available resources in a non-obvious way (Zampetakis & Moustakis, 2006). Therefore, creativity can be seen as an essential element of entrepreneurship. As stated by Lee *et al.* (2004, p. 82) *“entrepreneurship is a form of creativity and can be labelled as business creativity or entrepreneurial creativity because often new business are original and useful.”*

The boost of creativity is considered an important goal in higher education since *“individually and collectively we need to be creative to continually adapt and invent in an ever-changing and increasingly complex world”* (Jackson, Oliver, Shaw, & Wisdom, 2006, p. 1). In other words, generating business ideas to exploit business opportunities and nurturing the ability to engage in starting up a business are the core objectives of

entrepreneurship education and what differentiates it from more general and more widespread business education programmes (Andrew Penaluna & Penaluna, 2008).

Entrepreneurs encounter many different types of challenges, being one of them the capacity to generate or recognize ideas that have the potential to be developed into appealing goods or services. Often there has to be a balance between novelty and familiarity for ideas to become successful: new and different enough for consumers to pay attention, but sufficiently familiar to not be misunderstood or rejected for being too drastically different. According to Ward (2004, p. 173), *"The creative cognition approach views creative ideas as being the natural result of applying basic mental operations to existing knowledge structures. The originality of a given idea, which is the balance between its novelty and familiarity, will be determined by the processes employed and the way in which existing knowledge is accessed. Such novelty can be exploited to develop new product ideas or market niches"*. Following all these ideas, managers and potential entrepreneurs need to prepare themselves to be creative. The research developed by Ko and Butler (2007) indicates that this is done in three ways. The entrepreneurs they interviewed (1) built on their work experience and education, (2) used family, friends, and acquaintances to get information about technological trends and changes, and (3) remained alert and actively searched for new opportunities. The first attempt to investigate the link between creativity and entrepreneurial behaviour involved a survey of entrepreneurs, founding out that both the variety of information and the size of each one's knowledge base were important in identifying ideas. They stated their experience as follows:

"In many cases, the managers we interviewed indicated that they actually prepared themselves for discovery. During their period of preparation, they became immersed in and obsessed with the issues and problems surrounding their field of interest. One way this occurred was through knowledge gained from work experiences. Knowledge can also be gained through a more direct path such as reading journals or magazines. Respondent managers indicated that they read a lot, especially material they see as relevant to their field, and use the Web to search for new information. Formal education was also important. One manager noted: "My existing product is similar to what I did in my honours project, but with modifications." Different managers emphasized different sources as more or less important, but all were actively engaged in building their base of knowledge and saw this as an important factor in their ability to make discoveries." (Ko & Butler, 2007, p. 367)

This research revealed that the way in which managers link apparently unrelated bits of information is extremely important to creativity. They concluded that Chinese managers could link disconnected pieces of information from different sources in ways that led to new products or businesses. If, indeed, part of the creative process involves connecting formally unassociated parts of information into new combinations, this knowledge can serve as a potentially useful road for training entrepreneurs and students to be more creative in ways that make entrepreneurial behaviour more possible.

There is a diversity of procedures through which people can modify, expand or transform their stored knowledge. According to Ward (2004), one with special interest is conceptual combination, a method through which a person can mentally merge ideas,

concepts or other forms of information that until then existed separately. One reason conceptual combination can be particularly valuable in entrepreneurial creativity is that *combinations often represent specializations of their base concepts or head nouns, even when no opposition in meaning is present. To use a non-creative example, a pocket watch is a special type of watch with features that differentiate it from other types of watches*" (Ward, 2004, p. 178).

There is another procedure with a special connection to creativity called analogical reasoning or transfer, which consists in apply or project structured knowledge from a familiar field to a new or less familiar one. An example of this process is Rutherford's use of a solar system as a model for how the hydrogen atom was structured. The use of this type of analogy as a way of communicating a new idea can be particularly relevant to entrepreneurs. For instance, a potentially fruitful strategy can be using successful products as the familiar domain and project to a new domain the significant relations between the elements of that product (Ward, 2004).

These models can show that, in fact, creativity can be more than just problem solving. The creative behaviour requires numerous steps. In general, easily defined problems are not just given to innovators for them to solve right away. Doing something creative frequently involves a construction, formulation, or definition of the problem or assignment that the person wants to accomplish, it requires him or her to retrieve from memory or find pertinent information, and to create and evaluate potential paths of action. Even though recovery of existing knowledge is required to craft successful innovations, the way to access that knowledge can differ. These differences can be used as indicators of how a person have formulated or defined his or hers creative assignment, and these have the potential to affect the originality of the resulting idea (Ward, 2004).

Concerning the measurement of creativity and innovation, many different methods have been used to measure creativity and innovation (Barakat et al., 2014) and there are a number of studies that use a range of techniques to test creativity (Taggar, 2002), like studying individual and group creativity within an organizational background, testing creativity through the use of case study questions (relevant to the background of individuals) and analyzing by observational scale measures and written work scoring (Barakat et al., 2014).

It has been discussed that the concept of self-efficacy can also be used as a promising construct to understand creativity (Tierney & Farmer, 2002). Self-efficacy is defined as an individual's own belief in his/her skills and abilities linked to a determined activity. Self-efficacy has been researched extensively within social science disciplines but only more recently within management and entrepreneurial research. As a method of measurement, it has been employed in only a few studies. Given the clear links between self-efficacy and entrepreneurship, and in particular between creative self-efficacy and entrepreneurial education, it is clearly a powerful concept that can be used to better understand creative learning activities in entrepreneurial education and enhance teaching within this area (Barakat et al., 2014).

There is little doubt that creativity is a complex enough phenomenon that the structures and processes underlying the generation of new ideas will not be enough to explain it

fully. Clearly, interactive models are needed to provide a complete theoretical frame. This is no less true for entrepreneurial creativity than for artistic or scientific creativity. If we view successful entrepreneurs as those *“individuals who identify opportunities and start new companies to develop them”* (Baron, 2000, p. 15), then they will need to be able to do more than simply generate useful new ideas. Likewise, if we view entrepreneurial creativity as *“the generation and implementation of novel, appropriate ideas to establish a new venture”* (Amabile, 1997, p. 20), then a range of internal and external factors become relevant to the task.

Business managers have a much more specific interest in creativity because they see it as a link to innovation, which in turn leads to new businesses, better products, and a stronger competitive position for existing businesses (Ko & Butler, 2007). Yet entrepreneurship educators still struggle to explain how to assess creativity, idea generation, innovation and opportunity recognition in their field (Penaluna & Penaluna, 2009).

While many scholars acknowledge creativity as an essential aspect of entrepreneurship and most managers encourage creativity (Ward, 2004), very little is known about how the process works, especially with respect to recognizing entrepreneurial opportunities. As firms in less developed and newly developing economies attempt to move from product imitation toward product development and innovation, creativity is likely to become an increasingly important maintenance key to those who already hold a competitive advantage (Ko & Butler, 2007).

2.5. Entrepreneurial Creativity and Entrepreneurial Intentions

A factor that previously has not been considered in intention-based models is creativity, but recent studies have shown that creativity (together with prior entrepreneurial experiences) is positively associated with entrepreneurial intentions (Hamidi et al., 2008). Therefore, assessments of creativity have attracted considerable attention in the context of entrepreneurship education (Carey & Matlay, 2010).

DeTienne and Chandler (2004) have provided empirical evidence by examining the effectiveness of creativity enhancing training in the support of entrepreneurship education. Their findings indicate that creativity enhancing training contributed to significant improvements in university students' ability to think creatively. Their research also found that students' ability to think creatively prior to their training had a positive relationship with post-training outcome. In addition, they found that creativity training will lead to improvements in student's ability to identify business opportunities and their innovativeness. Although this work has enlightened our understanding of the effectiveness of creativity training, it provides limited insights to the specific relationship between creative ability and training outcomes, including learning potential and future learning intentions. More importantly, their work fails to discuss the methodological and

pedagogical issues related to designing effective creativity training programmes to support entrepreneurship education (Lourenço & Jayawarna, 2011).

The results of the study of Zampetakis (2008) show that perceived desirability intervenes in the effect of proactivity and creativity on entrepreneurial intentions. The mediation model provided evidence that proactive students (i.e. those who actively seek out and process information and take the initiative to improve current circumstances or create new ones) and creative students (i.e. those who produce new and useful ideas) have higher scores of intention to start their own business because they perceive the status of being an entrepreneur as desirable.

It has also been noted in the literature that the perception of the individuals enterprising skills, in particular the creative potential, have direct and indirect impact on intentions to business start-up (Liñán, 2008). The study conducted by Zampetakis and Moustakis (2006) has found evidence that engineering students' self-perceived creativity is associated with increased levels of entrepreneurial intent, implying that the link between creativity and entrepreneurial intentions may be closer than is currently thought. Their study confirmed a positive relationship between creative thinking and entrepreneurial intentions. This evidence points out the significance of nurturing enterprising skill through entrepreneurship education and, in particular, points to the importance of developing training programmes that aim to build up creative ability of nascent entrepreneurs (Lourenço & Jayawarna, 2011). The study of Zampetakis and Moustakis (2006) also supports previous suggestions that individuals with strong creativity anchor have a need to create something new and the argument of Feldman and Bolino (2000) that individuals with a strong creativity anchor are motivated to become self-employed.

Various entrepreneurial programmes now include learning activities designed to make the student think and act more creatively. This increasing number of creative learning activities now being taught created the need to better understand what impact they are having and if they are satisfying the theoretical concern of making individuals more creative, innovative and entrepreneurial. Creative Activities in Learning for Innovation (CAL4INO), a European EU funded project, investigates the role of creative learning activities to improve innovation within the context of entrepreneurship. The basis behind this is that people as teams develop meaningful innovations by merging designs, technology and business through creative activities, producing diverse perspectives, experiences and skills. To study and measure such activities, the instruments need to be flexible enough to measure any creative learning activity which objective is enhancing innovation and, by extension, entrepreneurial activity (Barakat et al., 2014).

The most common method of measurement chosen is entrepreneurial self-efficacy (ESE). ESE stands among the important personal factors that influence the abilities and chances of entrepreneurs, as it is a prerequisite for these groups to persist in their daily activities and in the achievement of their goals. ESE has been receiving an increasing amount of attention in the literature since it has been identified as having a role in new venture creation and is seen as an important antecedent to entrepreneurial action (Chen, Greene, & Crick, 1998).

2.6. Research questions

The decision to become an entrepreneur can be considered as voluntary and conscious (Krueger Jr. & Reilly, 2000). Consequently, it is important to analyze how the decision process takes place. In this sense, the development of entrepreneurial intentions would be the first step in this process (S. H. Lee & Wong, 2004). Thus, determining the impact of entrepreneurship education on entrepreneurial intentions is of important interest to understand this process (Liñán, 2004). Also, since creativity plays a major role in opportunity search strategies, as well as on business idea development (Jarna Heinonen et al., 2011), it is relevant to understand how to boost creative thinking and creative behaviour.

Of all the models of entrepreneurial intention, one that has been repeatedly applied, providing validated and empirically tested results is the Theory of Planned Behaviour (TPB) (Fayolle et al., 2006). For example, the researchers conducted by Kolvereid (1996b), Krueger *et al.* (2000) and Liñán and Chen (Liñán & Chen, 2009) demonstrated the effectiveness of using the TPB while studying entrepreneurial intent. The TPB can measure the development of intention through entrepreneurial education, that is, how a programme can influence participants regarding their entrepreneurial behaviour (Fayolle et al., 2006). According to this theory, the intention to exhibit a specific behaviour is influenced by three variables: attitude towards behaviour, perceived behaviour control and social norms. In addition for this study, it was decided to also investigate creativity and its impact on entrepreneurial intention.

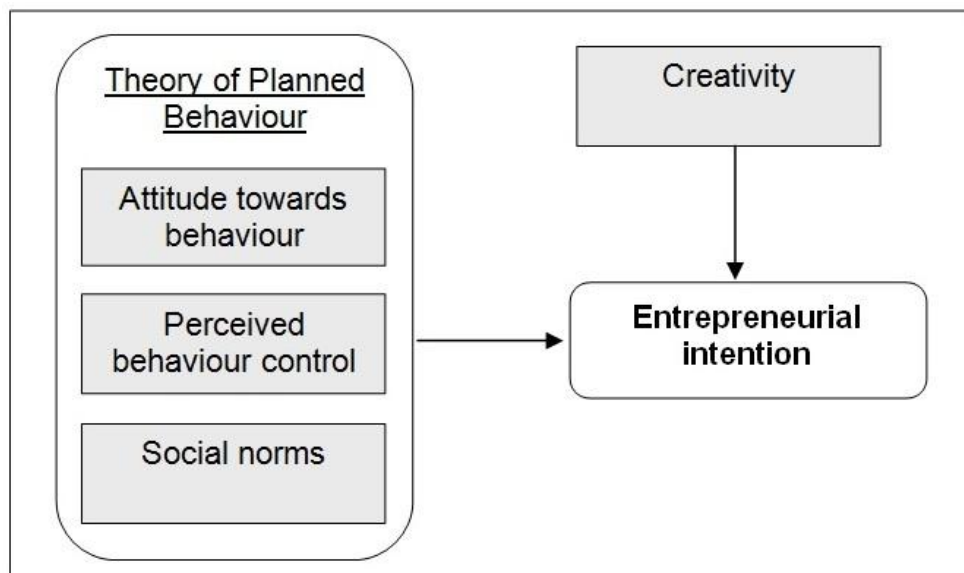


Figure 2 - Entrepreneurial Intention Conceptual Model

The students engaged in this study are higher education students attending an entrepreneurship programme during one semester. Since this is an ex-ante post-ante research, it is expected that, by the end of the semester, there will be a higher level of attitude towards the behaviour, perceived behaviour control and social norms than in the beginning of the semester. This is due to the association established between attending an entrepreneurship programme and entrepreneurial intention (Liñán & Chen, 2009; Lorz, 2011; Souitaris et al., 2007). This research aims to understand entrepreneurship education has any positive relationship to attitudes towards behaviour, social norms and perceived behaviour control. Also, a construct for creativity was added in order to comprehend if an entrepreneurship programme can have any type of impact on the development of students' creativity towards the development of ideas. According to Martin and Wilson (2014), creativity leads to discoveries and not the other way around, thus it is expected that creativity influence entrepreneurial intention.

According to the proposed objective for this study and having as basis the model of entrepreneurial intention previously discussed, it is intended to answer the following research questions:

Question I – To what extent does Entrepreneurship Education affects student's attitude towards behaviour, perceived behaviour control, social norms, entrepreneurial intention and creativity.

In this thesis, the impact of an entrepreneurship education programme it is based on the theory of planned behaviour. However, one more construct was added and is also being tested.

As previously mentioned, several authors have obtained positive results when applying the TPB in the evaluation of an entrepreneurship programme. However, not all elements of the theory reveal the same importance, especially when considered in the evaluation of a programme of entrepreneurship education (Fayolle et al., 2006). Regarding creativity, since generating business ideas to exploit business opportunities and nurturing the ability to engage in starting up a business are two of the main goals of entrepreneurship education (Andrew Penaluna & Penaluna, 2008), it is of extreme importance to understand the real impact that an entrepreneurship programme can have on students' creativity.

Question II – Considering the attendance of the subject of entrepreneurship, to what extent can entrepreneurial intention be explained by student's attitude towards behaviour, perceived behaviour control, social norms and creativity.

In the area of entrepreneurship, the theory of planned behaviour has been widely applied by a growing number of researchers, such as Kolvereid (1996b), Liñán et al. (2009) and Lüthje and Franke (2003), all confirming the positive relation between attitude towards behaviour, perceived behaviour control and social norms upon entrepreneurial intention. In what concerns creativity, it has been found a positive relationship between it

and entrepreneurial intentions (Hamidi et al., 2008), but there is the necessity of more positive results to confirm this. This study aims to understand the role that each of these factors play in students' entrepreneurial intention.

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Chapter 3: Methodology

3.1. Investigation goals

There is a growing interest from researchers regarding the connection between entrepreneurship and education in general and entrepreneurship education in particular (Fayolle et al., 2006). It has become critical to understand the real impact of entrepreneurship education on students, mainly the possibility of increasing their entrepreneurial intention, since it represents an important factor for the existence of entrepreneurial behaviour (Liñán, 2004). According to Krueger *et. al.* (2000) the decision to become an entrepreneur is taken voluntarily and consciously and, therefore, intentionally. Consequently, this decision is presumed to be planned and thus preceded by an intention to make it (Davidsson, 1995).

According to the more general models, entrepreneurial intentions are usually considered to be based on a person's attitude toward entrepreneurship, established social norms attached to entrepreneurship, and the level of self-efficacy (Hamidi et al., 2008). Creativity is a factor considered to be of extreme importance for various areas of entrepreneurship, since the creative application of ideas is a fundamental part of entrepreneurial activities (Walton, 2003), but is an aspect that, until recently, had not been taken into consideration in intention-based models. Since literature is now suggesting that creative individuals are more likely to engage in entrepreneurial behaviour (Ward, 2004) it is of major interest to analyse if there is a connection between entrepreneurship education and this new factor that is creativity, as well as its possible impact on entrepreneurial intentions.

According to Fayolle (2004) there are major differences between students who have attended entrepreneurship courses and those who have not. Thus, one of the main goals of this investigation is to analyze the impact of entrepreneurship education higher education students' on their entrepreneurial intentions as well as their creativity. For this, it is intended to verify, for the students that attended the entrepreneurship programme during the second semester of the school year 2013/2014, if there are modifications of their entrepreneurship intentions and their creativity, result of attending this programme. It is important to refer the complexity of this evaluation since it is difficult to identify the most appropriate method of measurement and also define the factors that are correlated with changing someone's intentions.

3.2. Research framework

Following the objective previously mentioned, two perspectives will be taken into consideration throughout this research: firstly, it will be evaluated the impact of entrepreneurship education on the students' attitude, perceived behaviour control, social

norms, entrepreneurship intention and creativity, and secondly, if entrepreneurial intentions can be explained by students' attitude, perceived behaviour control, social norms and creativity.

In this dissertation was used a research method to analyse a specific phenomena, test specific hypotheses and examine specific relationships. The research is formal and structured, based on representative samples, and the data obtained can be subjected to quantitative analysis (Malhotra & Birks, 2006). This type of analysis is used to identify and present data, indicators and visible tendencies, that in this particular research result from the observation of the students who attended the course of entrepreneurship.

To comprehend the impact of entrepreneurship education programmes on student's an ex-ante and ex-post testing design was used. The base instrument of the investigation relies on the conduct of surveys by handing to students a pre-questionnaire at the beginning of the entrepreneurship programme and, at the end, a post-questionnaire (that corresponded to same questionnaire of the beginning). The use of questionnaires to collect data had the advantage of being an approach that is extremely structured and that allows the controllability of large data samples (Lorz, 2011). A paired sample method was used to match the answers at the beginning and at the end of the course. The necessity to capture the development and changes in student's entrepreneurial intention, arising from the attendance to the subject of entrepreneurship, led to the appliance of different measurements at distinct moments. Therefore, the proposed method allows the analysis of the evolution over time, instead of studying in one moment of time. Once the questionnaires were handled to the same class at the beginning and at the end, it is considered that the samples (in the two moments of time) are relatively homogeneous and thus comparable. It was also used a control group to compare the results between those who attended the entrepreneurship course and to achieve more reliable conclusions.

3.2.1. The Sample

According to Lorz (2011), although school students are usually more used in this type of studies, from a perspective orientated towards economy and venture creation, university students can be a more interesting target group since they are closer to make a decision regarding the start of their career, whether it is on their own or on behalf of others.

For this research, the criteria used to obtain the samples was that the individuals had to be university students taking, for the first time, the course of entrepreneurship and a control group who had never had this subject before. Thus, the population comprise students of Portuguese higher education institutions enrolled in the second semester of the school year 2013/2014 attending the course of entrepreneurship and it is divided in two independent samples: the sample of students who attended the course of entrepreneurship (whether by option or by obligation) and a control sample of students who did not had the subject of entrepreneurship, part of a class who attended the class of Marketing at the Department of Economics, Management and Industrial Engineering

(DEGEI) of the University of Aveiro. After data collection, there were 486 students on the experimental group, 284 students who responded the questionnaire at the beginning of the semester and 202 responded it at the end of the semester, and 85 students on the control group, 47 students who answered the pre-questionnaire and 38 who answered the post-questionnaire. This variation of numbers means that not all of the students who answered the pre-questionnaire also answered the post-questionnaire. With that said, the sample would be reduced to 113 students who had their answers properly paired, during statistical analysis, of which 17 students correspond to the control group.

3.2.2. Questionnaire development

Prior to starting the development of the questionnaire, was conducted a literature review in order to find the best measuring instruments of entrepreneurial intention and creativity.

Regarding entrepreneurial intention, various articles were researched in order to understand which model, scales and methods are most commonly used to measure it (Kolvereid, 1996a, 1996b; Lorz, 2011; Souitaris et al., 2007). The construct of entrepreneurial self-efficacy was considered for the questionnaire (Chen et al., 1998); however, the lack of consensus regarding the entrepreneurial self-efficacy being a better scale to measure the entrepreneurial intention than the TPB was the major reason for not being considered.

It was visible that the literature had very well defined scales for this problem: the self-employment scales of Kolvereid (Kolvereid, 1996a, 1996b) were frequently used in studies which had entrepreneurial measurements as their objective and, more recently, the scale developed by Liñán and Chen (2009) validating a cross cultural research based on the TPB, which has proved to be more robust, since it is empirically tested, recognized and used by other authors (such as Lorz, 2011; Luthje & Franke, 2003). Also significant and constant in the literature was the TPB as a method of measurement, since it is commonly accepted as a reliable way of testing entrepreneurial intentions. This said, the theory of planned behaviour, along with its constructs, was the eligible theoretical concept chosen for this research and, consequently, the instrument used for the constructs of TPB was adopted from Liñán & Chen's (2009), being applied to measure the development of entrepreneurial intention resulting from the entrepreneurship education programme.

Regarding creativity, there are several different ways to assess creativity, including experiments (Ward, 2004) and assessment of creative tasks based on observations and various tests. It is obvious that the multifaceted nature of creativity makes it necessary to use an approach based on the combination of different methods, addressing a larger diversification of criteria for creativity in order to capture its many aspects and make findings more strong (Furnham & Bachtiar, 2008). However, to obtain more specific and reliable results, without having to use different tests with different scales, it was chosen the self-rating of creativity test developed by Batey (2007).

The questionnaire is structured in two distinct parts. In the first part, some questions were carried out regarding the socio-demographic characteristics of students, such as age, gender, university, academic degree, field of study and work experience. After this, a question was placed about whether or not the student was attending the course of entrepreneurship (to distinguish the experimental sample of the control sample). In terms of the second part of the questionnaire, it was divided in four groups of questions regarding the TPB – attitude towards behaviour, perceived behaviour control, social norms and entrepreneurial intention. The scales for each group of items were based on a seven point *Likert*-type scale, so the items regarding each construct were evaluated by each subject in a scale of 1 (strongly disagree) to 7 (strongly agree), indicating their level of agreement with each statement.

It was also handed the creativity test as a supplement. All students completing the questionnaire also completed the creativity test. As previously mentioned, the group of questions corresponded to the self-rating of creativity test, a measuring instrument developed by Batey (2007), where the score for creativity was composed by 11 items referring to personal attributes and the students were required to rate themselves in comparison with other people, using a *Likert*-type scale, from 1 (less) to 10 (more), indicating that the student considered himself to be less or more that attribute than others.

It is also important to note that the data collection was conducted during the second semester of the school year 2013/2014 through a mixed method that included handing the tests in person during class and through online way, which was done by each teacher lecturing the class of entrepreneurship in the different universities (University of Aveiro, Graduate School of Technology and Management of Águeda, University of Porto and of Minho).

Chapter 4: Analysis and Discussion of Results

Data analysis was performed using the *IBM SPSS Statistics 20* data analysis software. Lorz's research (2011) was the basis for selection of statistical tests and how these have been adopted sequentially in this dissertation. First, a characterization of the sample was conducted, using descriptive statistics. The second step consisted on conducting an analysis of the variables and the validity and reliability of scales. For the analysis of the variables, it was checked if the data was collected from a normal population and for the reliability of scales was used Cronbach's α . Finally, the hypotheses were tested through inferential statistics.

4.1. Sample characterization

As previously mentioned, the initial sample was composed by 571 students, of which 486 corresponded to the experimental group and 85 to the control group. Since the sample is divided in the group of students that answered the pre-questionnaire and the group of students that answered the post-questionnaire, it was necessary to pair the answers from the beginning of the semester with the answers from the end for each student, building a paired sample. Given that not all students answered the questionnaire at the two points of time, the final sample was reduced to 113 students, where 96 correspond to the experimental group and 17 to the control group. The following section presents a characterization of the paired sample (113 students).

The age gap of sample goes from 19 years old to 51 years old. Age average of participants was 22 years, approximately, whereas the mode was 20, which is constituted by 32 students (28.3% of the sample). Figure 2 shows both the frequency and the percentages of the age distribution.

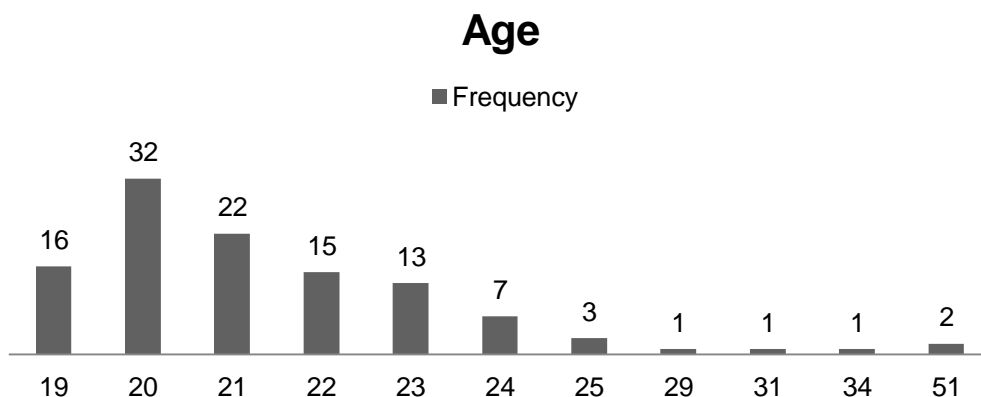


Figure 3 - Sample characterization by age

The sample is constituted by 78 female students, representing 69% of the sample, against 35 male students, that refer to 31% of the sample, as shown in Figure 3.

Regarding the higher education institutions of which the students from the sample are part of, although the questionnaires were forwarded to six different institutions, after pairing the answers from the pre-questionnaire with the ones from the post-questionnaire, only remained within the sample students from the University of Aveiro, represented by 77.9% (88 students), and from the Graduate School of Technology and Management of Águeda (ESTGA), represented by 22.1% (25 students).

The majority of students is attending a bachelor's degree. Within the sample, 82 students are still finishing their degree while 31 students are enrolled on a master's degree, thus 72.6% and 27.4% respectively.

There are also students from different fields of study: 47 students from social sciences and humanities, 40 students from exact sciences and engineering, 23 students from life and health sciences, and 3 students from natural sciences. On Figure 4 is shown the percentage division.

Gender

■ Masculine ■ Feminine

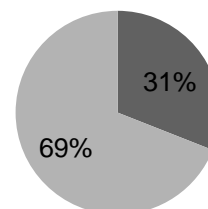


Figure 4 - Sample characterization by gender

Fields of study

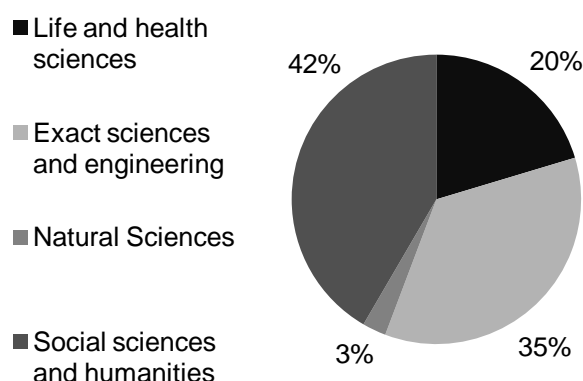


Figure 5 - Sample characterization by field of study

Among the sample there were students enrolled in several different courses, which included economics, marketing, business management, innovation management, tourism, management and industrial engineering, biology, biotechnology, biomedical sciences, civil engineering, chemistry, new communication technologies, applied languages and languages and business relations.

The questionnaire also asked of the student was a regular student or a working student. From this question it was possible to verify that the sample is composed mainly by full-time students, since only 4 students (3.5%) were working and studying at the same time.

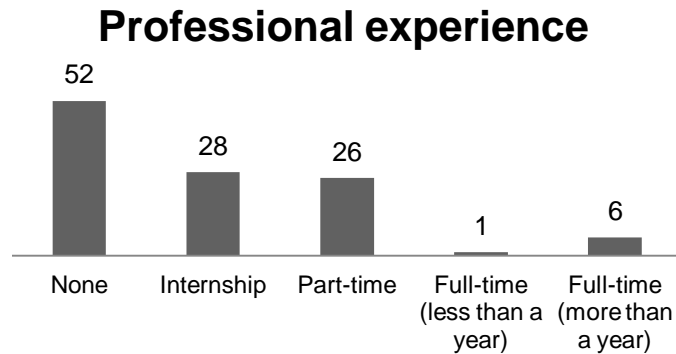


Figure 6 - Sample characterization by professional experience

Concerning the professional experience, there are also some differences within the sample. The majority of students never had a working experience, represented by 46% of the sample, while 24.8% had participated in internships and 23% in part-time jobs, and the rest had already worked in full-time jobs, 0.9% for less than one year and 5.3% for more than one year.

4.2. Selection Bias

Like previously mentioned, the sample used on this research comprises students from different fields of study. Thus, although all the students are enrolled in an entrepreneurship subject, for the exception of the control group, there are students taking the course because it is part of their major programme, as for example the business students, and others who chose to take it, such as the health sciences students. According to Lorz (2011) research, this may result in a selection bias of participants in the experimental groups with higher average values in comparison to the control group.

To test if there are significant differences between the means of both groups it was performed independent samples t-test, obtaining Levene's Test for Equality of Variances, which result will allow the t-test to be interpreted. The results obtained indicated no significant differences in variance between the groups for all the constructs, so the t-test needs was adjusted for interpretation of equal variances assumed. As shown in Table 1, the test indicates that the difference between means is not significant and so we can consider for the following tests that no statistically significant difference exists between the two groups (Acton, Miller, Maltby, & Fullerton, 2009).

	<i>N</i>		<i>Mean</i>		<i>Levene's Test</i>	<i>Equality of Means</i>		
	Experimental group	Control group	Experimental group	Control group	F	t	df	p-value
Start								
ATB	96	17	4,708	3,775	0,205	3,384	111	0,001
PBC	96	17	2,951	2,824	1,180	0,456	111	0,649
SN	96	17	4,663	4,000	0,370	1,911	111	0,059
EI	96	17	3,686	3,206	0,208	1,232	111	0,220
C	96	17	5,770	5,765	0,001	0,017	111	0,987
End								
ATB	96	17	4,556	3,814	0,302	2,187	111	0,031
PBC	96	17	3,741	2,941	0,340	3,014	111	0,003
SN	96	17	4,545	4,000	0,185	1,567	111	0,120
EI	96	17	3,790	3,020	0,356	1,939	111	0,055
C	96	17	5,948	5,588	1,007	0,806	111	0,422

Table 1 – Independent Samples t-test

4.3. Normal distribution test

In order to verify if the variables are appropriate for analysis it was first performed a test to check for missing values and to analyze if the variables are normally distributed.

For the verification of normal distribution were used the measurements of shape skewness and kurtosis to test the constructs. Skewness refers to the degree of skew - lateral deviation - of a distribution. Thus, a perfect normal distribution will be represented by a value of skewness of zero, given that there is no skew, and as far away from zero the greater the level of asymmetry of the distribution. If there exists a negative value, data is negatively skewed. Kurtosis measures the flatness of the distribution, so positive values indicate a peaked distribution and negative values indicate that the distribution is flatter. In both cases, values between -2 to 2 can be considered acceptable for a significance level of 0.05 and so we can assume that the data follow a normal distribution and is acceptable for parametric tests (Lorz, 2011).

Table 2 presents the values for skewness, that are between -0.294 and 0.473, and for kurtosis, which are between -0.754 and -0.102, indicating a normal distribution, and so it can be considered that the data was collected from a normal population.

	<i>Mean</i>	<i>Std. Deviation</i>	<i>Skewness</i>	<i>Kurtosis</i>
Start				
ATB	4,708	1,043	0,015	-0,248
PBC	2,951	1,086	0,473	-0,445
SN	4,663	1,330	-0,254	-0,102
EI	3,686	1,463	0,404	-0,672
C	5,771	1,365	-0,208	-0,315
End				
ATB	4,556	1,270	-0,294	-0,641
PBC	3,741	1,018	0,170	-0,557
SN	4,545	1,317	-0,034	-0,754
EI	3,790	1,477	0,275	-0,731
C	5,948	1,657	0,113	-0,235

Table 2 - Normal distribution test: skewness and kurtosis

4.4. Multicollinearity test

Stepwise regression and multiple regression are complicated by the presence of multicollinearity (Malhotra & Birks, 2006). Thus, to examine the collinearity of the independent variable, before trying to regress the independent variables on the dependent variable, tests for multicollinearity were carried out. Through SPSS software, using its specific collinearity diagnostics tool, it can be achieved two measures of collinearity: tolerance and variation inflation factor (VIF). The first measures the correlation between variables, varying from 0 to 1, where 0 is an indicator of a very strong relation between the independent variables analyzed. When tolerance is low, the existence of multicollinearity is a possibility (Bryman & Cramer, 2011). The second measure is an alternative indicator of collinearity and can be analyzed as follows: the higher the value of VIF the stronger the

relationship between independent variables. Nonetheless, there are no formal values to indicate multicollinearity. Summarizing, a high value of tolerance and a low value of VIF are good indicators of the non-existence of multicollinearity. The measures were calculated and are presented in Table 3. It is verifiable a high value for tolerance, since all variables are close to 1, and a low value for VIF, since the higher value is 1.282, and therefore it can be assumed that multicollinearity is not present (Lorz, 2011).

Coefficients (a)							
	Unstandardized Coefficients		Standardized Coefficients	Collinearity Statistics			
Model	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1 (Constant)	0,044	0,125		0,353	0,725		
Atitute	0,383	0,107	0,330	3,565	0,001	0,882	1,134
PBC	0,162	0,095	0,163	1,709	0,091	0,827	1,209
SN	0,182	0,078	0,231	2,343	0,021	0,780	1,282
Creativity	0,067	0,072	0,086	0,933	0,353	0,891	1,123

(a) Dependent Variable: Entrepreneurial Intention.

Table 3 - Multicollinearity test

4.5. Reliability Test

All constructs used in this research, for the exception of creativity, are multiple-item scales. Therefore, the internal consistency reliability should be tested for each group of items. According to Bryman and Cramer (2011), in multiple-item scales the internal reliability is particularly important, since it indicates if the scale is measuring a distinct idea and consequently if the items composing the scale are internally consistent or not.

On this research, it will be used the common method to verify internal reliability: Cronbach's alpha coefficient (α). To guarantee high reliability and viability, scales must be selected from articles recognized for their quality of impact according to evaluation rankings and thus for this research they will be based on Liñan et al. (2009). The Cronbach's alpha coefficient varies from 0 to 1, being a value between 0.6 and 0.8 usually considered an indicator of satisfactory internal consistency reliability and above 0.8 of good internal consistency reliability (Malhotra & Birks, 2006). In addition, it is suggested that if numerous factors exist, the calculation should be carried out separately: when the questionnaire has subscales it is normal to calculate Cronbach's alpha for each dimension rather than for the measure as a whole (Acton et al., 2009).

As previously mentioned, this research uses multiple-item scales for each construct, apart from creativity, which is a one-item scale. In Table 4 is presented the Cronbach's alpha coefficients for all scales. For the exception of attitude towards behaviour that presents a value of 0.737, which is considered satisfactory, all other scales present $\alpha > 0.8$, meaning good internal consistency reliability of the scales, so consequently it is acceptable to assume that all these scales are internally consistent.

	<i>N of Items</i>	<i>Mean</i>	<i>Cronbach's Alpha</i>
Constructs			
Attitude Towards Behaviour (Liñán & Chen, 2009)	6	-0,153	0,737
Perceived Behavioural Control (Liñán & Chen, 2009)	6	0,790	0,858
Social Norms (Liñán & Chen, 2009)	3	-0,118	0,896
Entrepreneurial Intention (Liñán & Chen, 2009)	6	0,104	0,862

Table 4 - Reliability test: Cronbach's alpha

4.6. Testing the research questions

Question I – To what extent does Entrepreneurship Education affects student's attitude towards behaviour, perceived behaviour control, social norms, entrepreneurial intention and creativity.

To analyze the impact of an entrepreneurship education program on students' attitudes, perceived behaviour control, social norms, entrepreneurial intention and creativity, a paired samples t-test was carried out and interpreted. For this test, which is applied to matched pairs, data can be collected in more than one points in time, where individuals are asked the same question at a starting point and over a period of time, as, for example, when comparing before and after values in an experiment (Acton et al., 2009). This is the type of case in analysis in this research. To verify the impact of attending an entrepreneurship subject, questionnaires were delivered to students at two different points in time: before taking the subject and after.

Although this research is based on Lorz (2011), following the investigation of Oosterbeek *et al.* (2010), and he uses the difference between scores at the end and at the start of the experiment, for both the experimental and the control group, to calculate the impact of entrepreneurship education between the two, the absence of a substantial control group led to the removal of the control groups and, consequently, the use of a simpler methodology.

Therefore, means for each variable were obtained and subtracted, in order to display mean differences from the pre-questionnaire (start) to the post-questionnaire (end). These results are displayed in Table 5, through the values of the mean differences, standard deviation, t-statistic, degrees of freedom and *p*-values.

	<i>Mean</i>	<i>Std. Deviation</i>	<i>t</i>	<i>df</i>	<i>p-value</i>
Start					
ATB Start-End	0,153	0,906	1,652	95	0,102
PBC Start-End	-0,790	1,059	-7,308	95	0,000
SN Start-End	0,118	1,331	0,869	95	0,387
EI Start-End	-0,104	1,050	-0,972	95	0,334
C Start-End	-0,177	1,353	-1,282	95	0,203

Table 5 - T-test for paired samples

The results presented on Table 5 indicate that there is no significant change for attitude towards behaviour, social norms, entrepreneurial intention and creativity. The only construct that presents a statistically significant change throughout the experiment is perceived behaviour control (for PBC, *p*-value<0.05). Thus, it is valid to affirm that, after attending an entrepreneurship programme, students show a higher perceived behavioural control and so entrepreneurship education affects positively the PBC of students. For the rest of the constructs there are no significant differences between the values at the end and start of the experiment, so it should be considered the null hypothesis, meaning that entrepreneurship education does not affect student's attitude towards behaviour, social norms, entrepreneurial intention and creativity. In Lorz's (2011) study similar results were found, with PBC being the only construct that changed significantly.

According to Fayolle *et al.* (2006), the control perception is connected to the ability of the students to acquire new knowledge and, by acquiring relevant theoretical knowledge in entrepreneurship and business management area, students feel more able to control the behaviour, thus, considering themselves capable of starting a business. Following this, Matlay's (2008) research concluded that, by attending an entrepreneurship programme, higher education students acquired bigger skills and knowledge to pursue an entrepreneurial career. This does not mean that the students have attitude to go ahead with, or intention to do it, or creativity enough to develop a new productive business, which can explain the small differences for those variables, and for the social norms it can be considered that they are more influenced by the social environment where the student is involved than by the entrepreneurship programme.

Question II – Considering the attendance of the subject of entrepreneurship, to what extent can entrepreneurial intention be explained by student's attitude towards behaviour, perceived behaviour control, social norms and creativity.

In order to test question number two and understand which constructs explain entrepreneurial intention, a multiple linear regression analysis was conducted. Multiple regression indicates which variables explain variance (not shared with other independent variables) in the single dependent variable (Acton et al., 2009), that in this research is entrepreneurial intention.

Two hierarchical regression models were calculated in order to test this research question. For both models will be used entrepreneurial intention at the end of the experiment as dependent variable. Model 1 uses the values of the control variables and independent variables at the start of the semester and correlate them with the dependent variable. For model 2 are the used control variables and independent variables at the end of the semester.

In step 1 of the first regression model, are regressed the control variables: age (scale), gender (0/1, female/male), field of study (0/1, social sciences/sciences) and professional experience (0/1, inexperienced/experienced). In step 2 it was done the same but including the independent constructs of the theory of planned behaviour: attitude towards the behaviour (ATB), perceived behaviour control (PBC) and social norms (SN), for the questionnaire handed in the beginning of the semester. In step 3, steps 1 and 2 were repeated and was added the new construct of creativity, also from the pre-questionnaire.

Regarding model 2, only two hierarchical steps of multiple regression are undertaken. In step 1 are again regressed the same control variables (age, gender, field of study and professional experience) but together with the independent variables attitude towards the behaviour (ATB), perceived behaviour control (PBC) and social norms (SN) from the questionnaire handed at the end of the semester. In step 2, step 1 is repeat but is also included the construct of creativity, also from the post-questionnaire.

Table 6 presents the results of the multiple regression and can help understand the relationship between the constructs and entrepreneurial intention. As it shows, in model 1, when considered the control variables by themselves, age, gender, field of study and working experience of the students explain 2.6% of entrepreneurial intention, but none of the constructs presents a value statistically significant. When in step 2 are also considered the independent variables ATB, PBS and SN, the influence of the control variables together with the independent variables increases to 43.5%. It is also observable that attitude towards behaviour and perceived behaviour control at the beginning of the experiment are the constructs which explain entrepreneurial intention the most and significantly predict entrepreneurial intention. In step 3, when adding the variable of creativity at the beginning of the semester to the prior mentioned variables, the totality of variables explain 44%, so there is a small increase from step 2. This small difference is in accordance with the *p*-value (0.391) obtained for the construct of creativity, which indicates that it does not significantly predict entrepreneurial intention, with ATB and PBC at the beginning of semester continuing go be the constructs which explain entrepreneurial intention.

	<i>Model 1 (EI End)</i>						<i>Model 2 (EI End)</i>			
	Step 1		Step 2		Step 3		Step 1		Step 2	
Step 1	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.	Beta	Sig.
Age	0,069	0,520	-0,050	0,581	-0,057	0,532	-0,052	0,344	-0,056	0,293
Gender	0,125	0,233	0,097	0,239	0,087	0,294	0,001	0,983	-0,003	0,947
Field of study	0,034	0,742	0,028	0,741	0,018	0,835	-0,044	0,421	-0,067	0,216
Professional experience	0,036	0,740	0,058	0,493	0,059	0,486	0,048	0,376	0,055	0,298
Step 2	Beta		Sig.		Beta		Sig.			
ATB Start	0,515		0,000		0,501		0,000			
PBC Start	0,272		0,007		0,274		0,006			
SN Start	-0,006		0,950		-0,017		0,860			
Step 3	Beta		Sig.							
Creativity Start	0,074		0,391							
Step 4	Beta		Sig.		Beta		Sig.		Beta	
ATB End	0,618		0,000		0,606		0,000			
PBC End	0,224		0,002		0,211		0,002			
SN End	0,177		0,007		0,150		0,020			
Step 5	Beta		Sig.							
Creativity End	0,133		0,017							
R	0,160		0,660		0,663		0,876		0,884	
R²	0,026		0,435		0,440		0,766		0,782	

Table 6 - Multiple Regression

In model 2, when observing the results from step 1, it can be verified that the control variables together with the independent variables attitude towards behaviour, perceived behaviour control and social norms at the end of the semester explain 76.6% of entrepreneurial intention. The three independent variables from TPB, on the contrary from the control variables, present $p\text{-value} < 0.05$, meaning they significantly predict

entrepreneurial intention. It is also verified an augmentation of percentage when comparing with the equivalent step on model 1, indicating that there is a difference between the same variables in the beginning of the semester and the end of the semester concerning to what extent they explain entrepreneurial intention. In step 2, it was added the variable creativity at the end of the semester to the variables used in step 1 of model 2. In this step the ensemble of variables explain entrepreneurial intention by 78.2%, more 1.6% than in the previous step. The constructs of TPB continue to present statistically significant *p*-values as well as creativity, with a *p*-value of 0.017, meaning all four variables significantly predict entrepreneurial intention.

In what concerns independent variables tested in the two models of research, it is visible that attitude explains entrepreneurial intention in the beginning and in the end of the semester. Furthermore, its standardized coefficient, for both start and end of semester, is the one that presents the strongest explanatory power regarding entrepreneurial intention. This is consistent with other studies analyzed, where was found a positive effect between attitudes and entrepreneurial intention (Kolvereid, 1996b; Luthje & Franke, 2003). Like ATB, also the perceived behaviour control explains entrepreneurial intention in the beginning and in the end of the semester, which is also consistent with some studies, such as Davidsson (1995) and Peterman and Kennedy (2003), who highlight the importance of PBC for entrepreneurial intention. Regarding social norms and creativity, the variables do not explain entrepreneurial intention at start but they do in the end of the semester, which means that it is acceptable to affirm that the subject of entrepreneurship taken between the two points in time may have had impact on the students' social norms and creativity.

4.7. Discussion of results

In the past, studies concerning entrepreneurship education impact have generally reported a positive impact of entrepreneurship education (Lorz, 2011). In fact, when researching literature about entrepreneurship education impact, it is easy to find studies with positive results (Fayolle et al., 2006; Matlay, 2008; Peterman & Kennedy, 2003; Souitaris et al., 2007). On another hand, there are also a few number of studies which have concluded that the impact of entrepreneurship education on entrepreneurial intention is insignificant (Lorz, 2011) or even negative (Oosterbeek et al., 2010).

On this particular research, in what concerns the specific impact of entrepreneurship programme on all constructs previously mentioned (attitude towards behaviour, perceived behaviour control, social norms, entrepreneurial intention and creativity) it was verified no statistically significant change for the variables attitude towards behaviour, social norms, entrepreneurial intention and creativity, between the beginning and the end of the semester, for the students who took the subject of entrepreneurship. Only the variable perceived behaviour control showed a statistically significant variation when compared at the beginning and at the end of the programme, meaning that it was the only variable impacted by entrepreneurship education. These results are consistent with the results obtained from Lorz (2011).

Regarding the attitudes, it is not simple to understand the results since the entrepreneurship programmes being studied are in fact concerned with the development of awareness and attitude. The reason for students' attitude not have increased significantly may be due to a relatively high level of attitude in the beginning of the semester, not leaving much room left for improvement, or perhaps the class methods and contents did not capture students' attention or interest.

From social norms perspective, as previously mentioned, a possible reason for entrepreneurship programmes to not have an impact on this variable may consist on social pressure to be entrepreneurial being largely extrinsic to the course and being much more related to the social environment in which the student is inserted, or even because they are just too young to start their own business and consequently there is not a huge pressure from family, friends and/or peers to follow that direction.

About entrepreneurial intention not being affected by entrepreneurship education, it is a result in compliance with previous studies (Lorz, 2011; Oosterbeek et al., 2010), that may indicate that the programme make students' expectations more real, leading some students to become less eager to follow an entrepreneurial career.

In terms of creativity, identically to the variable attitude, students already had a high level of creativity when starting the semester, not leaving much space for progression in this area. This aspect can be related to the fact that the mean of ages of the sample is 22 years old, so students are very young and full of ideas. The insignificant impact of entrepreneurship education on this variable can also be due to the type of classes not being creative or stimulant enough for the students or even to the duration of the programme being very reduced (only one semester, with about four hours of class per week), not allowing to have a real impact on students' creativity.

Perceived behaviour control was the only construct presenting a significant variation from start to end, what indicates that entrepreneurship programme had impact on it, which is in accordance with Peterman and Kennedy (2003) study, meaning that students' perception of feasibility became higher, so they felt more capable and considered entrepreneurial related tasks more easy to execute.

In sum, one of the possible explanations for the achieved results consist on the type of entrepreneurship programmes that are being studied, since the programme was mandatory for most of students on the experiment, which may influence answers (Oosterbeek et al., 2010) given that mandatory programmes may attract students who are not particularly interested in entrepreneurship. An entrepreneurship programme should be chosen on a voluntary basis so that there is attitude and consequent positive intention towards the behaviour, in this case, to create a business. Also, the elimination of the control group when performing the tests cannot be ignored, seeing as it may have had an impact on this study. It is also possible that one semester is not a long enough period of time to cause a real impact on students' entrepreneurial intentions or even to capture some potential long-term effects. On another hand, some of the main methodological deficiencies associated with the mixed results from previous studies are not observed on this research, such as the measurement of impact of entrepreneurship education only at

the end of a programme and use of small samples. From this point of view, this study attempted to overcome some of these shortcomings, however uncontrollable factors did not allowed to get a very large sample, particularly concerning the control group, forcing its removal from the sample being tested.

Analyzing the multiple regression test, in model 1, only the constructs attitude towards behaviour and perceived behaviour control in the beginning of the semester significantly influence entrepreneurial intention (44%). Since, in this study, entrepreneurial intention refers to the intention of executing an entrepreneurial behaviour, it is justifiable that it is influenced by the positive self-evaluation of being an entrepreneur (attitude towards behaviour) and the capability of performing it (perceived behaviour control). When analyzing the model 2, it is verifiable a variance from the beginning of the semester to the end of the semester. In the second model, all the constructs (attitude towards behaviour, perceived behaviour control, social norms and creativity) in the end of the semester explain entrepreneurial intention (78.2%), with ATB and PBC continuing to be variables which influence it the most. These results mean that attending the subject of entrepreneurship changed way that these variables influence entrepreneurial intention.

Chapter 5: Conclusion

This dissertation had as main purpose analyze the impact of entrepreneurship education on students. To this end, it was researched the connection between education in entrepreneurship and entrepreneurial intention, as well as creativity, taking into consideration students of higher education who attended the programme of entrepreneurship. This was achieved by testing students at the beginning and at the end of the entrepreneurship programme, with a post-ante research design, using the theory of planned behaviour as a basic structure.

The results indicate that the participation in a programme of entrepreneurship does not increase neither the entrepreneurial intention nor the creativity. However, the participation on this programme significantly increased students' perception of control over entrepreneurial behaviour. These results are in line with former studies, like the research carried out by Lorz (2011), where he obtained as result an insignificant impact of the entrepreneurship education programmes on entrepreneurial intention, with only the perceived behaviour control being impacted significantly.

It was also verified that the entrepreneurial intention of students is primarily explained by their attitude towards behaviour and their perceived behaviour control. Yet, after attending an entrepreneurship programme, students' social norms and creativity also had a statistically significant part on the explanation of intention. This relationship found between creativity and entrepreneurial intentions is in accordance with the results obtained on the research conducted by Zampetakis and Moustakis (2006), where students with high perceptions of their creativity also reported high entrepreneurial intentions.

This research contributes to the literature regarding the impact of entrepreneurship education since only the perceived behaviour control was found to be affected by the entrepreneurship programme, reinforcing the recent negative studies that go against the positive image established (DeTienne & Chandler, 2004; Fayolle et al., 2006; Matlay, 2008; Peterman & Kennedy, 2003). This shows the importance of better understand the mechanics of impact on entrepreneurial intention and redefine the objectives of entrepreneurship education in relation to the students. Also, it may be important to take into consideration how students differentiate amongst them in terms of creative potential so that the programmes can be more specific and profit different students' style of creativity. Incorporating creativity approaches on entrepreneurship programmes will help the students achieve new and indispensable skills to interact with the dynamic marketplace of today (Hamidi et al., 2008).

The present dissertation also contributes to the literature of entrepreneurial intentions through the conceptual use of the theory of planned behaviour since it was found out that attitude towards behaviour and perceived behaviour control are the most important variables explaining variance in entrepreneurial intention. However, the other construct from the TPB – social norms – also influences entrepreneurial intention after being affected by the attendance of an entrepreneurship programme. Regarding the new

construct added to this model – creativity – the same situation occurred. So, although these two variables do not have a large weight explaining entrepreneurial intention, it is relevant that there was a change from “not influencing at all” to “having a statistically significant influence”, when comparing results from beginning and end of the semester, meaning that the entrepreneurship programme may have had an impact on how these two variables influence entrepreneurial intention. This impact of creativity can be due to the fact that, as a concept, it is proactively oriented. According to Hamidi *et al.* (2008), the other factors can be considered good indicators of why entrepreneurship is seen as a viable employment alternative in the eyes of the students but, on another hand, creativity can proactively influence more the entrepreneurial behaviour in what concerns innovation, product development and marketing.

In what concerns the methodological limitations, it must to be taken into consideration the removal of the control group since it was composed by a reduced number of students. The use of a control group would have given a basis of comparison and would have probably produced different and more reliable results when explaining the impact of entrepreneurship education and also entrepreneurial intentions. Another limitation was created by the small sample given that a bigger sample would produce more realistic results and help to observe any variations that may have taken place. This limitation took place due to the fact that many of the students only answered one of the questionnaires and not both, and so, when pairing the answers from the pre-questionnaires and the post-questionnaire, and taking into account the total number of students to whom the questionnaires were handed to, the sample was reduced considerably. Thus, data collection with this type of methodology should be given great importance since it could be a limitation for future research. The short period of time can also be consider as a limitation, since a single subject of entrepreneurship taken over one semester may have a different impact then a programme with longer duration.

It should be interesting to carry out a longitudinal study, in order to contemplate the evolution of the participants from the start of an entrepreneurship programme until a few years later, in order to check if they have increased their entrepreneurial intention and if later that was translated into entrepreneurial behaviour. Another interesting idea, that could produce insightful results, would be to compare students attending an entrepreneurship programme on voluntary basis with students for whom the programme is mandatory. As previously mentioned it seems that it should be considered of importance to adjust the objectives and teaching methods to the type of entrepreneurship programme, whether it is mandatory or voluntary. For example, for students who do not choose to attend the programme voluntarily, the programme objective should focus on presenting entrepreneurship as an alternative career choice to the students, while transmitting them knowledge and relevant technical competences in the area of entrepreneurship, in order for them to feel that they can control better the entrepreneurial behaviour, comprehending the reality regarding this area (for example, which supports exist to start their own business). Nevertheless, an entrepreneurship programme should be attended voluntary so that there is attitude and consequent positive intention regarding the behaviour. In this case, the objectives should be different; the programme should be focusing on enhancing students' attitude and behaviour toward entrepreneurship.

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Appendices

Appendice I – Students' questionnaire

Este questionário procura analisar, junto dos alunos do Ensino Superior Português, o seu grau de intenção empreendedora. Este questionário será respondido no início e no final do semestre lectivo, tendo-se optado por analisar as respostas de forma emparelhada. Deste modo, o sistema solicita o seu número de aluno, tendo apenas como objectivo poder relacionar os dois momentos de resposta. Todos os dados são confidenciais e não são analisados individualmente.

Agradecemos a sua disponibilidade.

Ao terminar não se esqueça de carregar no botão "Submeter"

*1. Nº de aluno

*2. Idade

*3. Género

☐ Masculino

☐ Feminino

*4. Identifique qual a Universidade/Politécnico em que está a efectuar os seus estudos.

*5. Qual o grau de estudos que está a frequentar?

☐ Licenciatura

☐ Pós-graduação

☐ Mestrado

☐ Doutoramento

*6. Qual o ano que está a frequentar?

*7. Qual a área científica do curso que frequenta?

☐ Ciências da vida e da saúde

☐ Ciências exactas e da engenharia

☐ Ciências naturais do ambiente

☐ Ciências sociais e humanidades

*8. Qual o curso?

*9. Qual o seu estatuto de estudante?

☐ Trabalhador estudante

☐ Estudante ordinário

***10. Tem experiência profissional prévia?**

- ☐ Nenhuma
- ☐ Estágio
- ☐ Part-time
- ☐ Full-time, há menos de um ano
- ☐ Full-time, há mais de um ano
- ☐ Outro

Outro (especifique)

11. Se sim, avalie a sua experiência de trabalho:

- ☐ Positiva
- ☐ Negativa
- ☐ Sem opinião

***12. Está a frequentar a UC de empreendedorismo?**

- ☐ Sim
- ☐ Não

***14. Indique o seu nível de concordância com as seguintes afirmações.**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
Ser um empreendedor implica mais vantagens que desvantagens para mim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uma carreira como empreendedor é atraente para mim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Se eu tivesse uma oportunidade e recursos suficientes, gostaria de criar uma empresa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Se tivesse várias alternativas, preferia ser empreendedor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ser empreendedor é a opção mais indicada para o meu futuro profissional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu preferia ser dono do meu próprio negócio do que ganhar um grande salário sendo trabalhador por conta de outrem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***15. Indique em que medida concorda ou discorda das seguintes afirmações:**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
Criar uma empresa e mantê-la em funcionamento seria fácil para mim	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estou preparado para criar um negócio viável	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu consigo controlar o processo de criação de uma nova empresa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu conheço os detalhes práticos necessários para criar uma empresa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu sei como desenvolver um projeto empreendedor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Se eu tentasse criar uma empresa, teria uma alta probabilidade de sucesso	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***16. Indique em que medida concorda ou discorda das seguintes afirmações:**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
A família mais próxima acharia positivo se seguisse uma carreira de empreendedor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Os amigos mais próximos achariam positivo se seguisse uma carreira de empreendedor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outras pessoas importantes para mim achariam positivo se seguisse uma carreira de empreendedor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

***19. Indique em que medida concorda ou discorda das seguintes afirmações:**

	1 (discordo totalmente)	2	3	4	5	6	7 (concordo totalmente)
Estou pronto para fazer qualquer coisa para me tornar um empreendedor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
O meu objetivo profissional é tornar-me empreendedor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Irei fazer todos os esforços possíveis para criar e gerir a minha própria empresa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Estou determinado a criar uma empresa no futuro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pensei muito seriamente em criar uma empresa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tenciono firmemente criar uma empresa em algum momento futuro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendice II – Creativity test

Nome _____

nº de Aluno _____

1. Instruções de Preenchimento:

Esta escala pede-lhe para avaliar a sua percepção de 11 características pessoais, em comparação com outras pessoas.

Como exemplificação da forma de preenchimento:

“Em comparação com outras pessoas como se considera em termos de ...”

	Menor										Maior
altura?	1	2	3	4	5	6	7	8	9	10	

Ao assinalar a opção 2, o entrevistado indicou que, comparativamente com outras pessoas, considera-se mais baixo. Se tivessem escolhido 9 ou 10 teria indicado que se consideraria mais alto do que as outras pessoas.

	Menor										Maior
gentileza?	1	2	3	4	5	6	7	8	9	10	

Ao assinalar a opção 5, o entrevistado indicou que ele (a) considera-se tão gentil como as outras pessoas.

“Em comparação com outras pessoas como se considera em termos de ...”

		Menor									Maior
1	inteligência?	1	2	3	4	5	6	7	8	9	10
2	sensatez?	1	2	3	4	5	6	7	8	9	10
3	criatividade?	1	2	3	4	5	6	7	8	9	10
4	consciência das suas próprias emoções?	1	2	3	4	5	6	7	8	9	10
5	transmissão de emoções?	1	2	3	4	5	6	7	8	9	10
6	consciência das emoções das outras pessoas?	1	2	3	4	5	6	7	8	9	10
7	conhecimento?	1	2	3	4	5	6	7	8	9	10
8	sentido de humor/grça?	1	2	3	4	5	6	7	8	9	10

9	frequência/intensidade com que fica zangado?	1	2	3	4	5	6	7	8	9	10
10	impulsividade?	1	2	3	4	5	6	7	8	9	10
11	altruísmo?	1	2	3	4	5	6	7	8	9	10